

Structure and Magnetism of EuTiO_3

The tilting of the oxygen octahedra in cubic perovskites is known to induce structural phase transitions, which are often associated with the emergence of intriguing physical phenomena. While SrTiO_3 is one of the most extensively studied perovskite oxides for its structural phase transition at 105 K, the discovery of magnetoelectric coupling in isostructural EuTiO_3 has triggered many theoretical and experimental studies focused on this compound. I will present resonant ultrasound studies of the extremely subtle cubic to tetragonal structural phase transition at 288 K in EuTiO_3 single crystals and the evolution of the physical properties upon chemical doping. The collective set of experimental data contributes to a better understanding of the link between lattice, magnetic, and electrical degrees of freedom in the EuTiO_3 system, helps evaluate the similarities and differences between SrTiO_3 and EuTiO_3 , and provides insight in the possible origin of the much higher structural transition temperature for EuTiO_3 compared to SrTiO_3 .